CHEMICALLY SYNTHESIZED AND ASSEMBLED ELECTRONIC DEVICES

ABSTRACT OF THE DISCLOSURE

A route to the fabrication of electronic devices is provided, in which the devices consist of two crossed wires sandwiching an electrically addressable molecular species. The approach is extremely simple and inexpensive to implement, and scales from wire dimensions of several micrometers down to nanometer-scale dimensions. The device of the present invention can be used to produce crossbar switch arrays, logic devices, memory devices, and communication and signal routing devices. The present invention enables construction of molecular electronic devices on a length scale than can range from micrometers to nanometers via a straightforward and inexpensive chemical assembly procedure. The device is either partially or completely chemically assembled, and the key to the scaling is that the location of the devices on the substrate are defined once the devices have been assembled, not prior to assembly.